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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,096	07/28/2003	Joon-Sang Yu	5000-1-419	6361

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CHA & REITER, LLC  
210 ROUTE 4 EAST STE 103  
PARAMUS, NJ 07652

EXAMINER

VAN ROY, TOD THOMAS

ART UNIT PAPER NUMBER

2828

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/629,096	YU, JOON-SANG	
	Examiner <i>pc</i>	Art Unit	
	Tod T. Van Roy	2828	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____  | 6) <input type="checkbox"/> Other: ____                                     |

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities:

In the "Brief description of the drawings" figure 8 is not referenced.

In the "Brief description of the drawings" and in the "Detailed description of the preferred embodiment" fig. 1 is referred to as being the "front view". This terminology is confusing in that generally the "front view" would be taken to be the facet side at which light emission occurs. In this case a better-understood term to use would be "top view".

In line 7 on page 6 "Figs. 4 to 7" should read "Figs. 4 to 8".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 3, 6, 8 and 9 use the terms "higher" and "lower" which are vague and were not further defined in the disclosure. The examiner has taken the meaning of "higher" to be a branch of a waveguide for the out coupling of light, not containing the grating or active regions; "lower" has been taken to mean a branch of a waveguide wherein the grating and active region for light generation are present.

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Claims 2, 4, 5, 7, and 10 are rejected for being dependent on the indefinite claims.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-5, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Okamoto et al. (US 5787105).

With respect to claim 1, Okamoto discloses a distributed feedback laser (col.8 lines 23-28) comprising a guide layer including a plurality of waveguides coupled in a stepped multi-branch structure (fig. 5 #12), the guide layer used as a transmission medium for light having a predetermined wavelength (col.9 lines 14-18), and an active layer (fig. 6b #26), formed on the guide layer (fig.6b #22-25), for oscillating light (col.8 lines 63-67), wherein light is branched according to a predetermined ratio (inherent feature when splitting light between waveguides, eg. an arbitrary ratio of splitting will always exist) while proceeding from a higher (fig.5 Y-branch in upper right corner) to a lower (fig.5 mid-section of Y-branch under laser structure) waveguide within the guide layer.

With respect to claim 4, Okamoto discloses a distributed feedback laser further comprising a semiconductor substrate (fig.6b #21), a lower clad layer interposed

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between the semiconductor substrate and the guide layer (col.5 line 18) and an upper clad layer on the active layer and the lower clad layer (fig.6d #29) so as to surround the guide layer.

With respect to claim 5, Okamoto discloses a distributed feedback laser as in the rejection to claim 4 above, further comprising a upper electrode formed on the upper clad layer (fig.5 #701) and a lower electrode formed under the semiconductor substrate (col.7 lines 5-9, disclosing the bottom electrode although not as a preferred embodiment, note that non-preferred embodiments constitute prior art MPEP 2123).

With respect to claim 6, Okamoto discloses a distributed feedback laser (col.8 lines 23-28) comprising a guide layer having at least a higher and lower waveguide coupled in a stepped branch structure (fig. 5 #12), wherein light is transmitted having a predetermined wavelength (col.9 lines 14-18), and an active layer (fig. 6b #26), formed on the guide layer (fig.6b #22-25), for oscillating light (col.8 lines 63-67), wherein light is branched according to a predetermined ratio (inherent feature when splitting light between waveguides, eg. an arbitrary ratio of splitting will always exist) while proceeding (during feedback) from the higher (fig.5 Y-branch in upper right corner) to the lower (fig.5 mid-section of Y-branch under laser structure) waveguide.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2-3, and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto in view of Huang (US PG PUB 2002/0037024).

With respect to claims 2 and 3, Okamoto teaches the distributed feedback laser as described in the rejection to claim 1 above wherein the grating of a predetermined period (col.8 lines 63-67, describing the grating's feedback function as in a DFB laser where the small wavelength fluctuation is due to a selected grating period) is located above the lowest waveguide in the guide layer, Okamoto does not teach the grating to be formed under the guide layer. Huang teaches a distributed feedback laser wherein the grating (fig.2 #103) is formed under the guide layer (fig.2 #110, [0034] line 7). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the distributed feedback laser of Okamoto with the grating location of Huang in order to enhance coupling of light to the guide by placing the waveguide in-between the grating and active region.

With respect to claims 7 and 8, Okamoto teaches the distributed feedback laser as described in the rejection to claim 6 above wherein the grating of a predetermined

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period (col.8 lines 63-67, describing the grating's feedback function as in a DFB laser where the small wavelength fluctuation is due to a selected grating period) is located above the lower waveguide in the guide layer, Okamoto does not teach the grating to be formed under the guide layer. Huang teaches a distributed feedback laser wherein the grating (fig.2 #103) is formed under the guide layer (fig.2 #110, [0034] line 7). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the distributed feedback laser of Okamoto with the grating location of Huang in order to enhance coupling of light to the guide by placing the waveguide in-between the grating and active region.

Claim 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto in view of Findakly (US 4515428).

With respect to claim 9, Okamoto teaches the distributed feedback laser as described in the rejection to claim 1 above; Okamoto does not teach the guide to be of a hierarchal Y-structure. Findakly teaches the use of a multi-branching or hierarchal Y-structure for waveguides (fig.1). It would have been obvious to one of ordinary skill at the time of the invention to combine the distributed feedback laser of Okamoto with the waveguide structure of Findakly to allow for multiple outputs and for incorporation into optical networks (Findakly, col.1 lines 5-16).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto in view of Findakly and further in view of Huang.

With respect to claim 10, Okamoto and Findakly teach the distributed feedback laser as described in the rejection to claim 9 above including a grating having a predetermined period (Okamoto, col.8 lines 63-67, describing the grating's feedback function as in a DFB laser where the small wavelength fluctuation is due to a selected grating period); Okamoto and Findakly do not teach the grating to be formed under the guide layer. Huang teaches a distributed feedback laser wherein the grating (fig.2 #103) is formed under the guide layer (fig.2 #110, [0034] line 7). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the distributed feedback laser of Okamoto and Findakly with the grating location of Huang in order to enhance coupling of light to the guide by placing the waveguide in-between the grating and active region.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

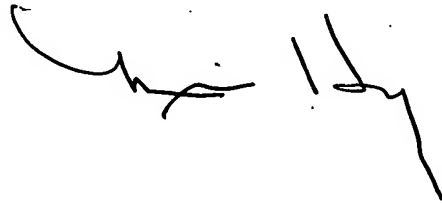
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR

A handwritten signature in black ink, appearing to be 'MINSUN CHU' followed by a stylized flourish.

MINSUN CHU  
PRIMARY